THE

Saturday Magazine.

Nº 338. OCTOBER 7TH, 1837. PRICE ONE PENNY.

RUSSIA. No. VII.

GROUP OF PEASANTS.

MANNERS AND CUSTOMS OF THE PEASANTRY.

WE have already made our readers acquainted with the habitations and dress of the Russian peasantry, it remains for us to endeavour to trace a few of their national, physical, and moral characteristics.

The Russian, generally, is of middle stature; the shoulders square, and the chest full; the muscular system of the upper extremities is strongly developed, but, averse to foot-exercise, his step is deficient in firmness and energy, and his limbs are feeble and ill formed,—a natural consequence of the practice general among the peasantry, of swathing the legs in thick bandages of coarse linen or wollen cloth, bound on by cords of birch-bark; his forehead is straight and narrow, his nose turned up or clubbed; his eyes small, round, and of hazel colour, glistening with an expression of deep low cunning, mingled with a merry leer, contrast most ludicrously with the gravity of his bushy beard, that falls over his brawny neck and ample chest; his hair brown and curly, varying in shade from the almost flaxen colour of the northern to the dark hue, approaching to black, of the southern provinces, is shorn straight round the head and over the eyebrows, in one continuous line, to ensure the regularity of which they put a deep wooden bowl upon the head and cut round its edge.

The excessive severity of the climate deadens, in a great measure, the delicacy of the organs of taste and smell (a fact of which the traveller too soon finds ample proof); the sense of hearing, however, is in comparison, usually very acute. His voice is strong, masculine, and harmonious. Deformities are comparatively rare; excessive want of cleanliness, and the severity of their mode of life, rendering it all but impossible for children of weak constitutions to survive, and sweeping off incredible numbers, even of those who, had a little common prudence and care been paid to their physical education, might have become efficient members of the community. In Moscow, the average population of which is estimated at about 280,000 to 300,000, nearly 5000 children, a number equalling one-half of the births, never attain the age of *one* year. The natural fondness of children displayed by the peasant, his innate courtesy of manners to strangers, contrast strangely with his harsh uncouth appearance.

In temperament he is warm, but very rarely vindictive. Impetuous and grossly abusive in language when irritated by an equal, but cringing to a superior, at whose feet, if he have offended him, he will throw himself, kissing the very ground,—ever cautious in proceeding to blows, he generally contents himself with a fury of words and angry vituperation, accompanied by abundant spitting. A fatalist in

principle, his courage is that of endurance rather than of action,—rather physical than moral; an exemplification of this is given in Count Segur's interesting narrative of the Campaign in Russia. He states that a body of Russian troops having been ordered to take up a position on the field of Borodino, drew up, in consequence of some error in the transmission of orders, within the range of a French battery of heavy metal, but ill supported, where they remained passive, whilst the French poured in a deadly fire, which swept their ranks and almost annihilated the corps, which made no attempt to carry the battery, as might have been done with comparatively little loss. The lower classes have so utter an abhorrence of military service, that, like the "Murci" of the degenerated Romans, they will frequently cut off a finger, or otherwise mutilate themselves, to secure an exemption. Among other expedients they sometimes thrust into the ear a berry of the *Daphne mezereum*, which produces a continued serous discharge without blistering. The practice so widely prevailed at one time, as to produce a repeal of the regulation by which those who had lost a finger, an eye, or a front tooth, were declared unfit for service.

Hospitality is a national virtue, most freely and cordially exercised among all classes,—charity towards the destitute is equally characteristic. In the humblest cabin of the most miserable village, the poor beggar, "kindly told to stay," is sure of finding food and warm shelter for the night, and a store of provisions for the morning's journey. This undiscriminating benevolence is, however, productive of an evil strongly felt in the large towns, where beggars, not from necessity, but from choice, actually swarm; and so lucrative is mendicity found, particularly by those who have the good fortune to possess any deformity, that they frequently pay a handsome abrok, or capitation tribute, to the lord of the soil to which they are attached, rather than abandon their degrading vocation, and return to labour in their native village.

In general the Russian has little taste for agriculture, the product of which is obtained only by that continued labour to which his volatile and inconstant temperament renders him strongly averse. He prefers the trade of the city, but, at the same time, is wholly incapable of entering into the spirit of commercial enterprise. There may be individual exceptions, but, as a body, the Russians never have been, nor will they ever become, distinguished for mercantile energy. The shopkeeper has no idea of establishing his credit by the sale of good articles, and by taking a moderate profit; he purchases as cheaply as he can, no matter the quality, and sells at any price he can get, no matter by what means,—always demanding much more than he will eventually take. The writer of this paper has frequently purchased at one-fifth the price asked; in one instance he purchased, from curiosity, for about 3*d.* a knife, for which the dealer asked four roubles,—nearly 3*s.* 6*d.*—"I assure you, sir," said the dealer, "I lose by it."—"Then why do you sell it?" "Why, the fact is, that the extent of my sales makes it answer my purpose," replied the man. Their utter disregard of all veracity and honour in their little trading transactions is inconceivably great. A bold barefaced lie seems more familiar to their lips than truth, nor will they blush for it when discovered; and, what is still more awful, the more impudent the falsehood, the more earnestly will they invoke their Maker to attest its truth.

As manufacturer, the Russian possesses, in the highest degree, the art of imitation, but he is incapable of carrying any branch of manufacture to perfection, contenting himself with giving his articles an external elegance of form, and totally disregarding the essential of useful solidity. The cutlery rivals in appearance the productions of the first Sheffield houses, with whose name it is generally stamped, but there all comparison ends. The woollen cloths are so highly finished, as to deceive any but a very good judge, but they are rotten in texture, and fugitive in colour. In fact, the same miserable short-sighted policy is visible in every branch of manufacture. The Russian, of every class, enters eagerly into any new project, but his ardour relaxes in proportion as difficulties become more serious, and is extinguished, the moment that a certainty of a conderable profit and immediate return no longer sustains his energies.

A great proportion of the peasantry from all parts of the empire, resort in the vigour of their age to the capitals, where they find employment as potters. (*Drornikĕ*,) coachmen, (*Izvoshtchikĕ*,) handicraftsmen and street hawkers. Some succeed in realizing a little money, furnishing a petty shop, or establishing a small manufactory. Scarcely one in ninety ends his days in the cities, by far the larger proportion quitting them, when old age, sickness, or intemperance, impairing their physical energies, incapacitates them from labour, return to their native villages, and to the bosom of their families, where the universal respect which is paid to old age and infirmity, ensure for the decrepit, kind treatment, and a quiet shelter, in which to linger out in tranquillity the remnant of his days.

The life of a Russian artisan is one of the most comfortless that can be conceived. Crowded together in low small rooms, unventilated, and heated in Winter to an insupportable temperature, they pass day after day without breathing the fresh air, and without even passing the threshold. In the selfsame room they work, and take their meals, and on its floor they sleep, wallowing in filth, and breathing an atmosphere so corrupted, so surcharged with disgusting pestiferous effluvia, that a stranger can scarcely endure it even for a few moments, whilst half an hour would be more than enough for the strongest nerves not utterly callous. The consequence is, that their appearance generally is in the highest degree unhealthy, their complexions have a livid cadaverous hue, their eyes are sunken, and of lead-like dulness, their limbs weak, their gait stooping and unequal. Wholly destitute of any healthful relaxation, either intellectual or physical, the only relief to which their uncultivated minds and enfeebled frames are disposed, is the brutalizing excitement of ardent spirits, and to this they eagerly fly at every leisure hour, so long as they possess the means of procuring it.

Never have we looked at those pitiable beings without feelings of the deepest commiseration, and without thinking of the happier, healthy, and intellectual operatives of our own heaven-favoured land. We have seen much of the misery of the manufacturing districts of London, and of the country, but we have never witnessed anything approaching in the slightest degree to the filth, the wretchedness, the moral and physical debasement of the Russian mechanic*. The only real comfort they enjoy is in the use of the vapour-bath, to which they resort in droves, on the vigil of a festival, to rid themselves of the weekly accumulation of filth and vermin. No class is more deserving of pity, and few share it less, till they return in prema-

* The Russians universally, and in a common way, employ the words "Tcheorn," *filth* literally, or "Tcheornié Lioude," *filthy people*, to designate the labouring classes.

ture old age, and broken in constitution, to the place of their birth, where the lord of the soil, compelled by the laws to provide for their support, gives their last refuge,—a coffin and a grave.

Were their habits less depraved they might enjoy many comforts, as they are better paid than others of an equal class. The wages of an ordinary artisan are about six shillings to eight shillings per week, whilst those of a domestic servant vary from six shillings to twelve shillings per month, including food, and in the latter cases, occasional presents of clothing. The number of peasants employed as hawkers, (*Rasnoshtchikë,*) is immense, the variety of their cries is vastly amusing, and their eager cunning method of bargaining, and recommending their wares, no less so. One of those occasionally heard, has often vibrated on our ears like the voice of an old familiar friend; "Lambs to sell! Young lambs to sell!" will be a cry not unknown to those of our own readers, who have not lost the pleasing remembrances of childhood, in the bustle of the busy world in maturer age. The intonation of the cry is the same to a note, and the words are not dissimilar.

The food of the poorer classes is simple and nutritious, but admits of little variety. The bread, of which it is chiefly composed, and which is still found at the tables of the higher classes, although nearly black, coarse, sour, and uninviting in appearance, is at once, wholesome and pleasant. Its low price of less than a farthing a pound, places it within the reach of all. Cabbages, which are cultivated in great plenty, and brought to high perfection, are equally cheap, a good sized cart-load costing about fourpence. Of these they make a soup flavoured with dried fish and mushrooms during the fasts, or with a small proportion of salted meats at other seasons. Mushrooms, of which their woods furnish a variety of thirty-five different sorts*, form an important item in their culinary preparations. They are dried for Winter use, and retain a considerable portion of their flavour. To these must be added onions, garlic (in lamentable profusion), and small cucumbers, the latter preserved in salt and water, with some carminative herbs, such as fennel, mint, and thyme. A great favourite among all classes, is a dish called *grayshnia kasha*, prepared from buck-wheat (*polygonum fagopyrum*); although highly nutritious, it is at first revolting to an Englishman, from its exact resemblance to brewers' grains; the first prejudice mastered, few fail to become partial to it. In England, we believe, the seed is grown merely to feed pheasants and domestic poultry, but it is to be regretted, that it is not more extensively introduced, as its cultivation requires little care, and as it is in fact, beneficial in clearing foul land in Summer, by its thick growth, smothering the weeds. The crop does not require longer than nine or ten weeks for perfection. The same grain is prepared in a vast number of ways, entering into the composition of sundry cakes, pancakes, and pies, in many of which it is combined with onions, carrots, mushrooms, and salted fish, minced together, and eaten with lamp oil.

The culture of vines in the southern provinces being yet in its infancy, wine is still an article of luxury, which the people regard with indifference, preferring unhappily the stimulant of ardent spirits. The taste for that is, however, now much less prevalent than formerly, in consequence of the general introduction of tea,—a beverage to which all classes are extravagantly partial. Some conception may be formed of the extent to which this indulgence is carried, when we state the fact, that in one of the taverns of Moscow, frequented by the class of shopkeepers and lower tradesmen, a whole chest of tea, weighing sixty pounds, is consumed in the course of one day. Every bargain is concluded over a cup of tea, whereas formerly it was followed by an adjournment to the wine-cellar, or the beer-shop. Many of the tradespeople pass a great portion of their time, talking over their business affairs, and making sales, in the coffee-houses, where they may be seen from morning till night, seated in bearded groups of three or four, at separate tables, covered with a dirty cloth, and ranged round the spacious and gaudily-painted rooms,—each individual with his left elbow leaning upon the table, and poising on the tips of his fingers and thumb, a saucer, from which he takes a frequent sip, in bringing it to his lips by a turn of the wrist, preceding each by a nibble from a lump of sugar, of which he retains a small portion between his teeth, through which he filters his tea, to get the flavour as it passes:—behind, to supply them with the long chibouques, stands a waiter in a clean white cotton shirt, with open sleeves reaching to the elbows, and *white loose* trousers, a napkin over his naked arm, his smoothly-combed hair shining with oil, parted in the middle, and falling over his ears, the upper part of the neck, to a level, with the orifice of the ears, closely shaven, whilst his well-tended beard descends in front, and hides his uncravatted throat, he is listening to the conversation, laughs, as in duty bound, at the jokes, of which he is often the but; and knowing everybody and everything, serves as a sort of ambulating directory.

The beverage in most general use, and at the same time very agreeable when new and well prepared, is *krass*, slightly and pleasantly acidulated; it is equally refreshing, without partaking of the intoxicating properties of ale. Mint is generally added, to make it more carminative,—a necessary quality in the drink of individuals who consume so considerable a quantity of vegetable food, tending to produce flatulency. There are several varieties of krass prepared with the juice of cranberries (*vaccinium oxycoccus*), and other fruits, sweetened with honey; but these, as well as mead,—the once national drink,—are only occasionally resorted to. They are principally sold by hawkers, who cry them about the streets, together with other preparations, including hot tea, *kees-lishtche* and *sbetine*, a favourite out-door drink in Winter, composed of honey and water, boiled with ginger, orris root (*iris florentinæ*), capsicum, and bay-leaves,—a wholesome and palatable beverage well suited to the climate. We add the following receipt for krass, to enable such of our readers as curiosity may induce, to make trial of a drink at once cheap, wholesome, and agreeable.

Take twenty pounds of rye-flour, five pounds of pale, and five pounds of high-dried malt; stir the ingredients well together in an earthen vessel with hot water, until a thick mash is made: put the jar into a well heated oven, for four or five hours; then take it out, and pour the contents into a mashing-tub, adding thirteen gallons of boiling water, and half an hour afterwards one gallon of cold water. Let it stand to settle, which it will do in about twenty-four hours: then pour the liquor into a cask, and ferment till very slightly acidulated; it will then be in a state for drinking, but it may, perhaps, be necessary to add, that it never will be *clear*. Infuse in it a few handfuls of mint leaves.

* Many of those species which are decidedly noxious in England, are in Russia perfectly edible.

Our domestic behaviour is the main test of our virtue and good-nature.—Seed

THE PHILOSOPHERS' STONE.
V.

IT may have excited the surprise of some of our readers, that after describing as a delusion the search after the Philosophers' Stone, we should have occupied so much space* in quoting instances which pretend to illustrate its existence, and its wonderful properties. We have adopted this course, because it is our desire to treat the subject fairly; and which is only to be done by examining it on both sides.

Without going very minutely into the particulars of either of the narratives given in the previous papers, we have no hesitation in stating our entire disbelief of what is there asserted; namely, that inferior metals were converted into gold and silver. We deem it contrary to the principles of nature, as it is also to the deductions of sound philosophy, to suppose that lead, or tin, or quicksilver, whether employed separately, or when combined, can by any process whatever, either by the action of fire, or by the operation or addition of any chemical compound, be transmuted into any one of the precious metals.

It is true that the admixture of various metals, in certain proportions, produces some very curious, and to those who are not conversant with such matters, some very unexpected results, of which the alloys known by the names of "Mosaic gold," "German silver," and "British silver," are familiar examples. But whatever changes may be effected in the appearance or durability of metals by being mixed, it is irrational to suppose that their proportions are thereby either increased or diminished, or that they are convertible into each other. Tin is tin, and silver is silver, and if we add a ton of the former to an ounce of the latter, their relative proportions continue the same. If it were otherwise, what should prevent us from making just what we required, without incurring the cost and labour consequent upon obtaining it in the ordinary way?

Many persons have been greatly puzzled when they have attempted to explain some of the accounts of transmutation, which have been handed down to us; and well they may, for we believe they undertake to do that which is utterly impracticable. Without impugning the veracity of the respective individuals on whose authority the narratives we have quoted, as well as many others of a similar character, have been generally received, we contend that it is much easier to believe that the parties in question were imposed on by some well-contrived piece of dexterity, than that gold or silver was produced in their presence, at the will of the operator, out of lead or tin, with the addition of some unknown substance enclosed in wax.

But there is something exceedingly suspicious connected with all the accounts of transmutation which we have ever seen. Those who appear to have sincerely believed in its practicability, laboured quietly and without ostentation, working on for years with equal diligence, and in many instances, at much greater cost than the most eminent experimentalists of the present day. The testimony of these men, in reference to the Philosophers' Stone, consists of little more than conjecture, and a vague belief founded on the reports of others. Of those who by way of distinction are termed *genuine* alchemists, we do not find one individual who plainly states that he had ever succeeded in transmuting a single grain of metal; whilst the few among them who considered themselves highly honoured by being permitted to see it done by others, have acknowledged their obligations to some mysterious stranger.

* See *Saturday Magazine*, Vol. X., p. 103.

That class, however, which adopted the profession of alchemy for the sake of a subsistence, consisted for the most part of needy adventurers. These unblushingly asserted that they were possessed of the all-potent powder of projection,—another name for the Philosophers' Stone,—and that all they required to enable them to produce any quantity, however large, of gold or silver, was a corresponding quantity of some inferior metal, as tin or lead, for instance. By such representations were the opulent persuaded to part with their money, in order that metal might be placed at the disposal of the impostors, who secretly sold it, and appropriated the proceeds to their own use. To keep up appearances, their patrons were by special favour permitted now and then to witness a successful experiment; and on such occasions, by introducing into the crucible a portion of one or other of the precious metals, the delusion was perpetuated, and the ruin of the privileged beholder rendered more certain.

Looking back, as we do now, upon these transactions, we may well wonder that persons could be found sufficiently credulous to be cheated out of their property by such artifices. One would have supposed that the very nature of the pretensions put forth by the alchemists, would have been sufficient to excite universal suspicion. Surely those who could obtain gold in any required quantity for others, may have managed to make some for themselves! But it is no less strange than true that the alchemists were noted for their poverty.

Is it not perfectly absurd that men should travel from town to town, and from country to country, offering for a suitable reward to communicate the secret for preparing the Philosophers' Stone? What motive could there be sufficiently powerful to induce any man to ask a reward from another, for that which enabled him to provide himself, at pleasure, with unlimited wealth? Was not the fact of asking to be paid for such a secret an undeniable proof that they had nothing to reveal?

Of the three instances of pretended transmutation quoted by us, if we look a little attentively at the most recent, as detailed by Mr. Hand, of Dublin, to his friend, Mr., afterwards Dr. Adam Clarke, may we not discover something like a well-matured scheme on the part of the principal actor in that curious affair? His first visit, in company with the person whom Mr. Hand describes as a priest, was evidently designed for the purpose of observation. A little flattery about Mr. Hand's ingenuity in the art of staining glass, and a few hints about metals and alchemy, we may suppose would be quite sufficient to allay suspicion, if any existed, and to awaken the curiosity of a man who had been many years seeking that, towards which his thoughts were thus unexpectedly directed.

At the second visit, what could have been better adapted to operate powerfully upon an easily excitable mind, such as it is manifest Mr. Hand possessed, than the successful experiment of glass-staining? In what subsequently took place, we feel quite satisfied that Mr. H. was grossly deceived. The skill of professed jugglers consists in practising deception so cleverly, that observers, if they trusted only their senses, without exercising their judgment, would believe them to be realities.

In the case under consideration as in the other two detailed by us, we see no necessity for denying that gold and silver were by some unexplained means substituted for the lead and the tin. This might have been the most important part of the trick.

But the most skilful of the alchemists were some-

times the dupes of their own stupidity. They purchased at a high price the powder of projection, prepared by persons who were called *adepts*. This powder contained a small quantity of gold or silver, which being found in the crucible at the end of some elaborate process, buoyed up the hopes, and stimulated the exertions of the operator.

The professed alchemists resorted to a great variety of ingenious devices to keep their employers in good spirits. Sometimes they used a crucible with a false bottom, beneath which they put a quantity of gold or silver, and above it the metal they pretended to transmute. Heat being applied, the false bottom disappeared, as did also, in due time, the materials it sustained; when pure gold or silver being found at the bottom, it was exhibited as an unanswerable proof of transmutation. At other times, preparations of gold or silver were placed in hollow rods, or pieces of charcoal, the apertures being neatly concealed with wax; and by these, and similar means, the required quantity of precious metal found its way into the crucible during the professed process of transmutation. If found there, no matter how or when it gained admittance, it was considered by those who were not in the secret, as a product resulting from the fusion of tin or lead, aided by a few grains of a red or white powder!

Returning again for a moment to Mr. Hand, let us remark, that in the story of the glass of water being set in a blaze, we may probably recognise what is now a very common chemical experiment. To be sure we know of no means for manufacturing 'live things like lizards,' nor do we believe that Mr. Hand's mysterious visiter was more competent to perform such a feat than ourselves. We can readily forgive Mr. H. for not seeing very distinctly what really was in the glass, when we recollect what a state of agitation and alarm he was in. At the conclusion of his first letter to Mr. Clarke, he says, "Oh my dear friend, I did not rest for two or three nights—dreaming and starting."

Among the writings of those who lived about the same time that alchemy prevailed, we discover frequent allusions to supernatural agency. By the great mass of the people, those who practised it were openly accused of sorcery, and of being in league with the devil; and in our own day, we believe that this ancient superstition is not entirely obliterated.

The alchemists have passed away. Let us be careful not to encourage their pretensions, nor to cherish their delusions, which are often presented to us under new and inviting forms. "The hand of the diligent maketh rich, but the LOVE OF MONEY is the root of all evil, which while some covet after, they err from the faith, and pierce themselves through with many sorrows."

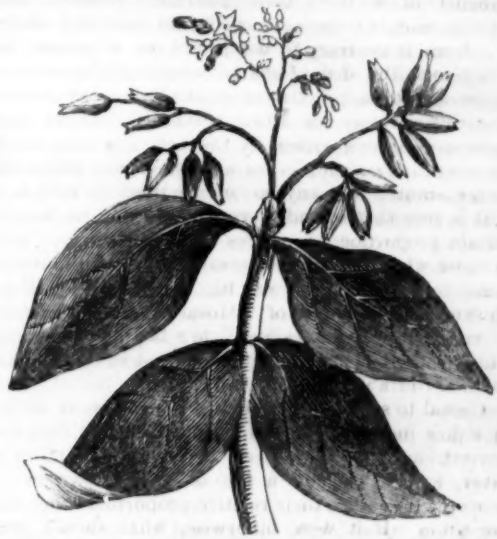
IT were to be wished that all who read the following expostulation would lay it deeply to heart.—"Why beholdest thou the MOTE that is in thy brother's eye, but considerest not the BEAM that is in thine own eye." There is a cutting question very similar to this of our Lord, proposed by a heathen.—"When you can so readily overlook your own *wickedness*, why are you more clear-sighted than the eagle or serpent of Epidaurus in spying out the *failings* of your friends?" This propensity of man to forget his own faults, and to look with the most criminal accuracy into those of his neighbour, which he often magnifies, distorts, and caricatures, is not only reprehended in the Sacred Scriptures, but also by many of the Greek and Roman writers. —HARMER.

THE manner of conferring benefits is often as material as the benefits themselves.—BLAIR.

TREES AND PLANTS USED IN MEDICINE.

The PERUVIAN BARK, (*Cinchona cordifolia.*)

THE Peruvian or Jesuits' Bark, which is so well known in Europe for its utility in cases of fever and ague, is the produce of several species of trees, natives of South America, and the West Indies. That represented in the engraving is supposed to produce the best sort of bark. The tree is described as being about fifteen feet high, and six inches thick: it somewhat resembles our cherry-tree, and is found abundantly in the hilly parts of Quito in Peru, where it is spontaneously propagated from its own seeds.



LEAF, FLOWER, AND SEED-VESSEL OF THE PERUVIAN BARK.

The mode in which the virtues of the Peruvian Bark were discovered has been variously stated. According to some, the Peruvians learnt the use of the bark, by observing that a Peruvian affected with the ague was cured by having drunk of a pool, in which some felled trees had so long soaked, as to give the taste of their bark to the water. About the year 1640, the lady of the Spanish viceroy, the Comitissa del Cinchon, was cured by this medicine: from this it is said to have obtained the name of Cinchona; and from the interest the Jesuits and the Roman Catholics took in its distribution, it received the name of Jesuits' Bark.

There are two sorts of this bark, the pale and the red. "The pale is brought to us in pieces of different sizes, either flat or quilled, and the powder is rather of a lighter colour than that of cinnamon. The red is generally in much larger, thicker, flattish pieces; but is sometimes also in the form of quills, and its powder is reddish, like that of the Armenian bole. It is much more resinous, and possesses the sensible qualities of the Cinchona in a much higher degree than the other sorts; and the more nearly the other kinds resemble the red bark, the better they are now considered. The red bark is heavy, round and dry; pliable between the teeth, does not separate into fibres, and breaks, not shivery, but short, close, and smooth. It has three layers; the outer is thin, ragged, and of a reddish-brown colour, but frequently covered with mossy matter; the middle is thicker, more compact, dark coloured, very resinous, brittle, and yields first to the pestle; the inmost is more woody, fibrous, and of a brighter red.

STUDY always to be beloved of good men, and seek not to be hated of the evil.—SIR THOMAS SMITH.

CARBONIC ACID. I.

FOR many years Carbonic Acid was designated *fixed air*, the name given to it by Dr. Black, by whom it was discovered in 1757. It was the first aëriform fluid which was correctly investigated, and whose properties were ascertained to be very different from those possessed by common air. Hence it may be supposed to have led the way to the discovery of a variety of other kinds of gases, and to some of the most interesting, as well as important facts, connected with modern chemistry.

Entering largely into the composition of the greater part of the solid materials of which our globe is constructed, the production, decomposition, and reproduction, of Carbonic Acid, constitutes a series of phenomena equally wonderful as they are instructive. But of the various agencies which unceasingly operate around us and within us, we believe that those connected with gaseous bodies are least understood and appreciated. Nor is this a matter of surprise. In studying the structure of a plant, an insect, or an animal, there is something to deal with which commends itself immediately to the understanding, through the medium of the senses; it is otherwise as respects the investigation of the habits and properties of aëriform bodies. Our knowledge of them, it is true, must be acquired by the exercise of the external senses, but still the process is somewhat refined and difficult, as compared with other branches of philosophic inquiry.

Carbonic Acid is composed of the vapour of carbon (the pure and inflammable part of charcoal,) and of oxygen combined, as respects their volumes, in equal proportions. These substances exhibit, however, a property very common to gaseous bodies, termed condensation, by which, in the present instance, is meant, that one volume each of carbon-vapour and oxygen (making together two volumes,) are equal only to one volume when chemically combined. Thus, supposing 100 cubic inches of the vapour of carbon and 100 cubic inches of oxygen gas to be united, the resulting compound will be equal to 100 inches of carbonic acid gas.

It is proper to remark that the vapour of carbon cannot be obtained in a simple state. There are many substances of whose existence the chemist can satisfy himself, but he has not sufficient skill to procure them in a separate form. Carbonic Acid is an example of this. If you take a known quantity of pure oxygen gas, and place in it a piece of charcoal which has been previously ignited, the combustion of the charcoal will go on vividly for a time, and then entirely cease. The gas thus acted on by the burning charcoal will continue to occupy the same space that it did before, but it will be found to have increased in weight, and exactly what the gas has gained, the charcoal will have lost. The properties of the gas will also be changed; for, previous to the introduction of the charcoal, it was a supporter of combustion, and, as constituting one-fifth portion of the atmosphere, essential to vitality; now, however, it is no longer capable of supporting combustion, and it is destructive to life.

The process just described is that by which the formation of Carbonic Acid is beautifully illustrated. The charcoal being ignited, it is converted into vapour, which, uniting spontaneously with the oxygen, gives the results we have already mentioned.

Carbonic Acid is produced in a variety of processes; as, for instance, fermentation, combustion, respiration, and the decay and final decomposition of animal and vegetable substances. Hence it is always present in the atmosphere; not only at the surface of the earth, but, in about the same proportions, at the summits of the loftiest mountains. Its proportions vary at the same place within short intervals of time, being affected by changes of weather and of the seasons. During the night there is more Carbonic Acid present in the air than by day, and in cloudy weather it is more abundant than when the sun shines. It has been ascertained, that 10,000 parts of air contain, on an average, about five parts of Carbonic Acid, a proportion exceedingly small, when we remember the vast quantities which are hourly produced, especially in large cities.

The substance of which we are treating is a transparent and colourless gas. Let us take a lump of chalk, the size of a walnut, put it into an ale-glass one-third filled with water, and then add a little hydrochloric acid, (spirit of salt,) effervescence will ensue, indicating the escape of gas, but in its colour, and other appearances, we shall not be able to detect anything different from the surrounding atmosphere. If we now light a slip of paper, and put it into the glass, just above the surface of the liquid, the flame will be extinguished, affording a proof that the gaseous body present has properties differing from those possessed by common air. Our previous knowledge of the effect of diluted hydrochloric acid upon chalk enables us to determine, that the gas disengaged, as just described, is Carbonic Acid Gas. Chalk is called carbonate of lime, and it consists of lime chemically united with Carbonic Acid. The lime, however, has a greater affinity for hydrochloric acid than it has for carbonic, and hence, by combining with the former, the latter is set at liberty.

Carbonic Acid is equally unfit for respiration as it is for supporting combustion; animals confined in it immediately die. When in a pure state, its effect upon the respiratory organs of man is that of violent spasm at the entrance of the windpipe, (an apparatus termed the *glottis*,) by which its admittance into the lungs is effectually prevented. When sufficiently diluted to permit of its being inhaled, it speedily operates as a narcotic poison.

The density of Carbonic Acid is greater than that of air, in the proportion of rather more than 15 to 10; so that if a given bulk of the former weigh 15 lbs., an equal bulk of the latter will weigh 10 lbs. To this peculiarity may be attributed the fact, that Carbonic Acid sometimes accumulates at the bottoms of wells, sewers, mines, and other cavities, which happen to be connected with some fissure in the earth through which the gas enters; under such circumstances it is called *choke-damp*, and many fatal accidents have happened by its means. As a good practical rule for detecting the presence of this gas in the situations just referred to, it is usual to let down a lighted candle, and when that is extinguished no person is permitted to descend. Let it not, however, be concealed, that instances have occurred in which this simple, and, in most cases, satisfactory test, has proved fallacious; for, although the candle continued alight during the experiment, yet was the atmosphere sufficiently contaminated to produce insensibility; and, but for timely aid, the lives of the individuals exposed to its influence would have been lost.

As Carbonic Acid never accumulates, in the way just mentioned, at the surface of the earth, notwithstanding its great density as compared with air, we may infer that changes of temperature, and the agitations to which the atmosphere is constantly liable, (taken in connexion with a known law, by which all gases have a tendency to diffuse themselves among each other,) are instrumental in promoting its equal distribution. On this principle we recommend that,

whenever Carbonic acid is known, or suspected to exist in any place to which it is necessary to have access, as the bottom of a well for instance, that after the careful application of the candle-test, another, which is equally simple, should not be omitted; this consists in throwing water, say 20 or 30 pailsful, as the case may be supposed to demand, into the well, which, by causing a commotion in the column of impure air, it will at length be sufficiently mixed with fresh air, that the descent may be effected without risk or inconvenience. For reasons that hereafter will appear, a mixture of lime and water will be more useful than water only.

We must not omit to mention, that Carbonic Acid, when existing in places such as those above described, is always produced near to the spot where it is found. It never separates itself from the atmosphere to accumulate in low situations, by the mere force of gravity. In the kingdom of Naples there is a cave, called the Grotto del Cane, which has for ages been famous for the quantity of Carbonic Acid which issues from it, covering its bottom to the depth of several inches. This cave measures about eighteen feet from the entrance to its inner extremity, and consists merely of a hole or cavity in the side of the mountain. An old man who used to show this spot to travellers, kept a dog, which, on being thrust into the cave, was immediately suffocated; his master, however, seems to have ascertained with great accuracy how much the poor animal could endure, for, on throwing him into a pool of water, he soon recovered, and stood ready for the performance of a similar feat, to gratify the next visiter.

Referring again to the extraordinary density of Carbonic Acid, we may enumerate some of its effects, which are very curious. For instance, it may be poured from one vessel to another, or drawn off by a cock, in the same manner as water or any other liquid. If we take a tall glass jar, place in it a lighted taper, and then pour into the jar some of the gas, the taper will be extinguished. This experiment will appear the more remarkable, as the eye is incapable of detecting anything in one vessel different from that in the other.

THE FIRST TWENTY YEARS OF LIFE.

It is a saying of Dr. Southey's, "that live as long as you may, the first twenty years are the longest half of your life." They appear so while they are passing,—they seem to have been so when we look back to them, and they take up more room in our memory than all the years that succeed them.

But in how strong a light has this been placed by the American teacher, Jacob Abbott, whose writings have obtained so wide a circulation in England. "Life," he says, "if you understand by it the season of preparation for eternity, is more than half gone; life, so far as it presents opportunities and facilities for penitence and pardon,—so far as it bears on the formation of character, and is to be considered as a period of probation,—is unquestionably more than half gone, to those who are between fifteen and twenty. In a vast number of cases it is more than half gone, even *in duration*; and if we consider the thousand influences which crowd around the years of childhood and youth, winning us to religion, and making a surrender of ourselves to Jehovah easy and pleasant:—and, on the other hand, look forward beyond the years of maturity, and see these influences losing all their power, and the heart becoming harder and harder under the deadening effects of continuance in sin, we shall not doubt a moment that the years of immaturity make a far more important part of our time of probation than all those that follow."

That pious man, who, while he lived, was the Honourable Charles How, and might properly now be called the honoured, says, that "twenty years might be deducted for education from the threescore and ten, which are the allotted sum of human life; this portion," he observes, "is a time of discipline and restraint, and young people are never easy till they are got over it."

There is, indeed, during those years much of restraint, of wearisomeness, of hope, and of impatience, all which feelings lengthen the apparent duration of time. Suffering I have not included here, but with a large portion of the human race, in all Christian countries, (to our shame be it spoken,) it makes a large item in the account; there is no other stage of life in which so much gratuitous suffering is endured, —so much that might have been spared,—so much that is a mere wanton, wicked addition to the sum of human misery, arising solely and directly from want of feeling in others, their obduracy, their caprice, their stupidity, their malignity, their cupidity, and their cruelty.—*The Doctor.*

ADVENTURES OF A HUNTER.

One of the anecdotes related to me, gave a picture of the accidents and hard shifts to which our frontier rovers are inured. A hunter, while in pursuit of a deer, fell into one of those deep funnel-shaped pits, formed on the prairies by the settling of the waters after heavy rains, and known by the name of sink-holes. To his great horror he came in contact, at the bottom, with a huge grisly bear. The monster grappled him: a deadly contest ensued, in which the poor hunter was severely torn and bitten, and had a leg and an arm broken, but succeeded in killing his rugged foe. For several days he remained at the bottom of the pit, too much crippled to move, and subsisting on the raw flesh of the bear; during which time he kept his wounds open, that they might heal gradually and effectually. He was at length enabled to scramble to the top of the pit, and so out upon the open prairie. With great difficulty he crawled to a ravine formed by a stream, then nearly dry; here he took a delicious draught of water, which infused new life into him, then dragging himself along from pool to pool, he supported himself by small fish and frogs.

One day he saw a wolf hunt down and kill a deer in the neighbouring prairie; he immediately crawled forth from the ravine, drove off the wolf, and, lying down beside the carcase of the deer, remained there until he had made several hearty meals, by which his strength was much recruited.

Returning to the ravine, he pursued the course of the brook until it grew to be a considerable stream; down this he floated until he came to where it emptied into the Mississippi. Just at the mouth of the stream he found a forked tree, which he launched with some difficulty, and, getting astride of it, committed himself to the current of the mighty river. In this way he floated along until he arrived opposite the fort at Council Bluffs. Fortunately he arrived there in the day-time, otherwise he might have floated unnoticed past this solitary spot, and have perished in the idle waste of waters. Being descried from the fort, a canoe was sent to his relief, and he was brought to shore more dead than alive, where he soon recovered from his wounds, but remained maimed for life.

[Washington Irving's *Tour on the Prairies.*]

FACTS IN COMPARATIVE ANATOMY.

The means employed by Nature to prevent a bird falling from its perch during sleep, are purely mechanical, and in no respect depend on the voluntary act of the animal itself. The effect is produced by means of a strong tendon, which is fixed to the upper part of the bone of the leg; this tendon passses through a tendinous loop at A, then over the joint at B, then down the back of the bone to C, where it unites with smaller tendons connected with each of the toes; the effect of this arrangement is, that the more heavily the body of the bird presses downwards, as sleep prevents its using the voluntary muscles of the leg by which it is kept in an erect position, the more the joint of the leg at B is bent, and consequently, the long tendon we have noticed is drawn tighter, and the toes brought together, and forced to clasp with increased firmness, the perch on which the bird rests. This movement of the toes is easily shown, by taking the leg of a fowl after it is removed, previous to being cooked, and finding the tendon we have spoken of; the power it possesses of bringing the toes together can easily be proved.

Nature, in all her works, however dissimilar they may appear at first sight, appears to have formed her creatures with reference to one *type* or pattern. In man, the most perfect of her creation, we find the bones and muscles of the hand most elaborately developed, and we find the same number of bones, in various states of developement, and more or less perfectly formed in every other part of the creation; sometimes, some are enlarged at the expense of others, and at other times, the whole of them are nearly obliterated, but still there is always an indication of every part which is to be found in the more perfect type from which they are derived. The pectoral fin of a whale is an illustration in point; in this case, although the animal seldom uses its fin except to assist it in swimming; all those bones that occupy the place of the hand are perfectly formed, enabling the creature to clasp its young to its breast when in danger; the remaining bones which occupy the place of the bones of the arm are short, and imperfectly formed, the two bones of the fore-arm being soldered, as it were, together; outwardly these bones are not visible, the whole fin being covered with skin and fat.

BONES OF THE FIN OF THE WHALE.

We do, indeed, but little, if we do not induce our children to think, to compare, and to apply,—to draw religious and moral inferences; and, in short, to extract from nature, from history, and from everything they see, read, or experience, lessons which will guide their future conduct, and promote their everlasting welfare.—Mrs. John Sanford.

Flowers.—Flowers, of all created things the most innocently simple, and most superbly complex,—playthings for childhood, ornaments of the grave, and companions of the cold corpse in the coffin! Flowers, beloved by the wandering idiot, and studied by the deep-thinking man of science! Flowers, that of perishing things are the most heavenly. Flowers—that unceasingly expand to heaven their grateful, and to man their cheerful looks—partners of human joy, soothers of human sorrow; fit emblems of the victor's triumphs, of the young bride's blushes: welcome to the crowded halls, and graceful upon solitary graves. Flowers are, in the volume of nature, what the expression "God is love" is in the volume of revelation. What a desolate place would be a world without a flower! It would be a face without a smile—a feast without a welcome. Are not flowers the stars of the earth, and are not our stars the flowers of heaven? One cannot look closely at the structure of a flower without loving it. They are emblems and manifestations of God's love to the creation, and they are the means and ministrations of man's love to his fellow-creatures; for they first awaken in his mind a sense of the beautiful and good. The very inutility of flowers is their elegance and great beauty; for they lead us to thoughts of generosity and moral beauty, detached from and superior to all selfishness; so that they are pretty lessons to nature's book of instruction, teaching man that he liveth not by bread or from bread alone, but that he hath another than an animal life.—*Chapter on Flowers.*

NOTHING.

Most writers like on *something* to dilate,
And *some* on *anything* would spend their time;
But *everything* is now in such a state
That "*nothing*" best befits *my* humble chime.

Hail! then, the subject; and All hail! the bard
"Who can write well on *nothing!*"—Few beside
Would claim this meed!—but yet, with due regard
To *others'* rights, my chaplet I'll *divide!*

What art thou, Nothing?—Nothing but a name!
Yet so connected with all earthly ties,
That Glory, Reputation, Pleasure, Fame,
All end in thee—from whom they took their rise!

What's Friendship? Nothing!—Love? "an emptier sound!" [Pride?
Honour?—Wealth?—Splendour?—Dignity?—and
I asked the tombs—(with solemn sculptures crowned)—
"Nothing!"—a hollow moan from each replied.

Yet much depends on Nothing!—Nothing known,
Nothing is wanted; and the vacant breast,
Where Ignorance erects his leaden throne,
Asks nothing to secure its *placid* rest!

He that "says nothing"—though a very dunce,
May often for an imp of wisdom pass:
He that prates *everything*, betrays at once
The empty head—less stored with brains than brass.

Nothing!—Why thou art something—like a theme!
One which, the more I search, the more I find:
And, should Invention fail, through toil extreme,
Right well I know that *thou* art still behind!

In by-gone days, what time I tuned my lyre
Anxious to gain the meed of lasting fame,
To what fond heights did not my Muse aspire!
She looked for *due* applause—when Nothing came!

On graver themes I next my powers essayed,
And turned the page of philosophic lore,
(Ah! vainly to my aching sight displayed!)
What was my meed?—*neglect*, and—nothing more!

I do not like thee! Yet I find thee ever
Meddling with each design and rising scheme;
Sure to succeed my very best endeavour,
And prove my hope is—Nothing but a dream!

I am of Nothing, and to Nothing tend!
On earth I Nothing have, and Nothing claim;—
Man's noblest works shall know one common end,
And "Nothing" crown the tablet of his name.

Enough! I've proved the ancient *dictum* wrong,
That "nothing out of nothing can be made;"
And if of Nothing I have sung too long,
'Tis but the fault of many of my trade!—Nemo.

LONDON:
JOHN WILLIAM PARKER, WEST STRAND.
Published in Weekly Numbers, price One Penny, and in Monthly Parts price Sixpence.